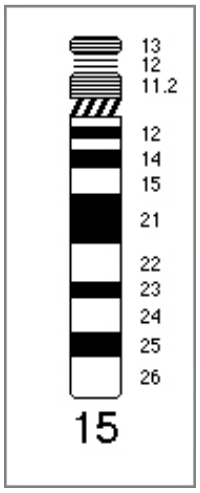
15q26 Deletion



15q26 is the most distal segment of the long arm of chromosome 15. Its size is ~13 Mb. This segment is subdivided into 3 sub-segments: 15q26.1, 15q26.2 and 15q26.3. Almost all deletions of 15q26 are terminal, and isolated deletions of 15q26.3 are the most common variant.

Individuals with deletion of the q26.3 segment are mostly characterized by intrauterine and postnatal growth retardation, microcephaly, intellectual disability, and congenital heart defects. There are several genes within this region that are thought to contribute to the physical features identified in individuals. Specifically, it is thought that the gene IGF1R is responsible for many of the identified characteristics1.

IGF1R1 activation promotes cellular proliferation and growth. When one copy of IGF1R1 is deleted or nonfunctional, severe prenatal and postnatal growth restriction can be the result2. In relation to 15q26 deletions, growth restriction, microcephaly, and dysmorphic facial features are all potentially attributed to IGF1R1 being deleted.

While severe prenatal and postnatal growth restriction are a key feature of 15q26.3 deletions, there are many other features readily identified in patients such as developmental and intellectual delays, which may be identified in up to 70% of individuals and can be variable1. Some patients have been reported to be delayed in head control, sitting independently, crawling, standing, and walking1. Others, however, have been reported to only require minimal assistance in school3.

There are several other physical features that may be identified in patients as well. While dysmorphic facial features are frequently reported, there is no characteristic facial pattern. Some patients have been identified to have a triangular face shape, hypertelorism, low nasal bridge, thin upper lip, downturned corners of the mouth, and micrognathia4. Microcephaly is common amongst individuals. Additionally, skeletal defects including proximally placed thumbs, clinodactyly, brachydactyly, polydactyly, broad feet, pes planus, and hyperlaxity of joints have also been previously reported in several patients4.

Some individuals have deletions involving more proximal areas – 15q26.2 and 15q26.1. Those patients with distal 15q26.3 deletions may also have serious birth defects along with those manifestations described above. The most common are heart defects which were found in almost 24% of patients1. This may include defects such as ventricular septal defect, atrial septal defect, and patent ductus arteriosus4. Diaphragmatic hernias occur in significant percentage of patients with deletions involving 15q26.2. It is estimated that 15q26 deletions account for approximately 1.5% of all congenital diaphragmatic hernias in newborns2. Some patients with more proximal 15q26 deletions have serious kidney problems (unilateral agenesis, cystic dysplasia). All these defects may seriously affect vital prognosis for persons with more proximal 15q26 deletions.

REFERENCES

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